

**REMARKS**

Please reconsider the application in view of the following remarks.

Applicant thanks the Examiner for carefully considering this application.

**Disposition of Claims**

Claims 1-29 are pending in this application. Claims 1, 13, 28, and 29 are independent. The remaining claims depend, directly or indirectly, from claims 1 and 13.

**Drawings**

The Examiner has failed to accept the drawings filed on November 6, 2001. Applicant respectfully requests the Examiner to indicate whether the filed formal drawings are acceptable.

**Rejection(s) under 35 U.S.C § 103**

Claims 1, 5-7, and 9-11 stand rejected under 35 U.S.C. § 103(a) as obvious over “The LDUP Replication Update Protocol” (“Stokes”), U.S. Patent Application Number 2001/0016880 (“Cai”), and U.S. Patent Number 5,434,994 (“Shaheen”). This rejection is respectfully traversed.

The Examiner asserts that Stokes manages replication of data contained within the directory server from the supplier server to the consumer server. However, Stokes does not teach managing the replication of data using a plurality

of pluggable services as asserted by the Examiner. Further, Stokes does not even teach how the updates are managed; Stokes only teaches that updates take place so that all of the replicas eventually converge and contain the same directory data (*see* Stokes pages 2-3, section 3).

The Examiner proceeds to state that Cai teaches a plurality of pluggable services. Although Cai arguably teaches the use of a pluggable service, the application of the pluggable service is not related to managing the replication of data contained within a directory server from the supplier server to the consumer server. Cai fails to teach or suggest that a pluggable service could be used to manage data replication. In addition, the pluggable service taught in Cai includes three parts: a Device Abstraction Layer (DAL), a Service Abstraction Layer (SAL), and a Kernel Service Engine (KSE) (*see* Cai page 2, paragraph [0045]). In contrast, the pluggable services taught in the claimed invention includes, for example, a change sequence number service, an update resolution procedure service, a replica update vector service, a replication agreement service, and an incremental update algorithm service (*see* page 9, paragraph [0033] of the instant specification).

Further, the Examiner asserts that Shaheen teaches using a change log. However, Shaheen does not teach that the change log of data replicated to the consumer server is maintained on the consumer server. In addition, Shaheen does not teach or suggest that the replication of data is managed by the plurality of pluggable services using the change log.

In addition, the Examiner asserts that Stokes teaches an update resolution procedure service that determines the ordering of operations by comparing a first change sequence number of the supplier server to a second change sequence number of the consumer server. However, Stokes does not teach comparing a first change sequence number of the supplier server to a second change sequence number of the consumer server. Stokes merely mentions the term “change sequence number” and gives no explanation of how to use the change sequence number (*see* Stokes page 9, section 5.3.2.1), and Stokes does not teach how to use the change sequence number to determine the ordering of operations. Also, Stokes does not teach using an update resolution procedure. Stokes merely mentions the term “update resolution policy” (*see* Stokes page 3, section 3), but does not set forth an update resolution procedure service. In contrast, the claimed invention teaches an update resolution procedure service that determines the ordering of operations by comparing a first change sequence number of the supplier server to a second change sequence number of the consumer server (*see* pages 9-10, paragraph [0034] of the instant specification).

The Examiner asserts that Stokes teaches a replica update vector service. Stokes does not teach a replica update service that determines the set of updates to be sent to a data replica by consulting a replica update vector for the consumer server as asserted by the Examiner. Stokes only teaches that a replica update vector is sent if the consumer is prepared to accept updates (*see* Stokes page 6, section 5.2). Stokes does not teach how the replica update vector is used.

Specifically, Stokes does not teach that the replica update vector may be used to determine the set of updates to be sent.

The Examiner also asserts that Shaheen teaches an incremental update algorithm service. However, the algorithm taught in Shaheen is a “bully” algorithm which elects servers based on the highest priority (*see* Shaheen column 6, lines 18-32). In contrast, the incremental update algorithm service taught in the claimed invention compares a first replica update vector of the supplier server and a second replica update vector of the consumer server to order an update sequence from the change log (*see* page 10, paragraph [0037] of the instant specification). Therefore, Shaheen does not teach an incremental update algorithm service.

In view of the above, Stokes, Cai, and Shaheen, whether considered separately or together, fail to teach or suggest the present invention as recited in the claims. Thus, claim 1 is patentable over Stokes, Cai, and Shaheen. Dependent claims are allowable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

Claims 2-4 stand rejected under 35 U.S.C. § 103(a) as obvious over Stokes, Cai, and Shaheen, and in further view of U.S. Patent Number 6,647,393 (“Dietterich”). This rejection is respectfully traversed.

The Examiner asserts that Stokes teaches copying between a supplier server and a consumer server. However, Stokes only appears to teach a supplier sending an operation to a consumer, and a consumer sending an operation to the supplier (*see* Stokes page 3, section 4). In contrast, the claimed invention teaches a

directory information tree copied between the supplier server and the consumer server (*see* claim 2 of the instant specification). Stokes does not teach copying; specifically Stokes does not teach or suggest copying a directory information tree. Furthermore, even though Dietterich arguably teaches a directory information tree, neither Stokes nor Dietterich teach or suggest copying a directory information tree between the supplier server and the consumer server, especially since Stokes does not teach copying as the Examiner asserted.

Further, the Examiner asserts that Stokes, Cai, and Dietterich teach that the replication of data is managed by the plurality of pluggable services using the directory information tree. As stated above, the pluggable services taught by Cai differ from the pluggable services in the claimed invention. In addition, even though Dietterich arguably teaches a directory information tree, none of Stokes, Cai, or Dietterich suggests having the pluggable services use the directory information tree to manage the replication of data.

In view of the above, Stokes, Cai, and Shaheen, whether considered separately or together, fail to show or suggest the present invention as recited in claims 2-4. Dietterich does not teach what Stokes, Cai, and Shaheen lack, therefore claims 2-4 are patentable over Stokes, Cai, and Shaheen, in further view of Dietterich. Accordingly, withdrawal of this rejection is respectfully requested.

Claims 13, 14, 20-22, 24-26, 28, and 29 stand rejected under 35 U.S.C. § 103(a) as obvious over Stokes, Shaheen, and U.S. Patent Number 6,782,398 ("Bahl"). This rejection is respectfully traversed.

Further to the same arguments made above regarding Stokes and Shaheen, the following arguments address additional differences between the claimed invention and the Examiner's assertions. The Examiner asserts that Shaheen teaches using a plurality of services to manage replication of data. However, the passage the Examiner cites from Shaheen teaches the use of a plurality of processors and a plurality of storage devices (*see* Shaheen column 2, lines 55-61). Further, Shaheen teaches that a Network Controller performs services to control access to the network (*see* Shaheen column 4, lines 18-21). Shaheen does not teach a plurality of services to manage replication of the data contained within the directory server from the supplier server to the consumer server.

In view of the above, Stokes and Shaheen, whether considered separately or together, fail to teach or suggest the present invention as recited in claims 13, 28, and 29. Bahl does not teach what Stokes and Shaheen lack, therefore claims 13, 28, and 29 are patentable over Stokes, Shaheen, and Bahl. Dependent claims are allowable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

Claims 15, 16, 19, and 23 stand rejected under 35 U.S.C. § 103(a) as obvious over Stokes, Shaheen, Bahl, and in further view of Cai and Dietterich. This rejection is respectfully traversed.

The Examiner asserts that Cai teaches the use of pluggable services. As argued above, the pluggable services taught in Cai differ from the pluggable services in the claimed invention. Further, the Examiner asserts that Stokes

teaches the replication of data, and that Dietterich teaches to use a directory information tree (or subtree). However, as argued above, Stokes, Cai, and Dietterich do not teach or suggest providing replication of data managed by a plurality of pluggable services using a directory information tree (or subtree).

For the same reasons stated above, Stokes, Shaheen, and Bahl whether considered separately or together, fail to show or suggest the present invention as recited in claims 15 and 16. Cai and Dietterich do not teach what Stokes, Shaheen, and Bahl lack, therefore claims 15 and 16 are patentable over Stokes, Shaheen, and Bahl in further view of Cai and Dietterich. Dependent claims 19 and 23 are allowable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

Claims 17 and 18 stand rejected under 35 U.S.C. § 103(a) as obvious over Stokes, Shaheen, and Bahl, and in further view of U.S. Patent Number 6,397,329 (“Aiello”). This rejection is respectfully traversed.

The Examiner asserts that Aiello teaches the use of incremental update protocol. However, Aiello merely states the term “incremental update method” (*see* Aiello column 8 lines 26-28), and does not teach how to use an incremental update protocol nor does Aiello teach what applications an incremental update protocol would be used. Neither Stokes nor Aiello teach or suggest using an incremental update protocol for updating data. In contrast, the claimed invention uses the incremental update protocol to compare the supplier server and consumer server replica update vectors to properly order the update sequence.

Further, the Examiner asserts that Aiello teaches the use of a total update protocol. Aiello does not teach the use of a total update protocol; in fact, Aiello does not even use the term “total update protocol” or any equivalent terms. Aiello teaches a “total daily update cost” (see Aiello column 17 lines 51-52) that is used to perform a cost comparison, which is totally unrelated to the update protocol of the present invention.

For the same reasons stated above, Stokes, Shaheen, and Bahl whether considered separately or together, fail to show or suggest the present invention as recited in claims 17 and 18. Aiello does not teach what Stokes, Shaheen, and Bahl lack, therefore claims 17 and 18 are patentable over Stokes, Shaheen, and Bahl in further view of Aiello. Accordingly, withdrawal of this rejection is respectfully requested.

Claim 12 stands rejected under 35 U.S.C. § 103(a) as obvious over Stokes, Cai, and Shaheen, and in further view of U.S. Patent Number 6,615,223 (“Shih”). This rejection is respectfully traversed.

For the same reasons stated above, Stokes, Cai, and Shaheen, whether considered separately or together, fail to show or suggest the present invention as recited in claim 12. Shih does not teach what Stokes, Cai, and Shaheen lack, therefore claim 12 is patentable over Stokes, Cai, and Shaheen in further view of Shih. Accordingly, withdrawal of this rejection is respectfully requested.

Claim 27 stands rejected under 35 U.S.C. § 103(a) as obvious over Stokes, Shaheen, and Bahl, and in further view of Shih. This rejection is respectfully



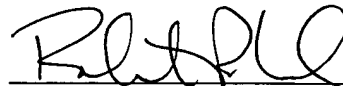
traversed.

For the same reasons stated above, Stokes, Shaheen, and Bahl, whether considered separately or together, fail to show or suggest the present invention as recited in claim 27. Shih does not teach what Stokes, Shaheen, and Bahl lack, therefore claim 27 is patentable over Stokes, Shaheen, and Bahl in further view of Shih. Accordingly, withdrawal of this rejection is respectfully requested.

Applicant believes this reply is fully responsive to all outstanding issues and places this application in condition for allowance. If this belief is incorrect, or other issues arise, the Examiner is encouraged to contact the undersigned or his associates at the telephone number listed below. Please apply any charges not covered, or any credits, to Deposit Account 50-0591 (Reference Number 13220.010001).

Respectfully submitted,

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